**Hungry Hungry Humans**

Groups of 4 or 5

Each group has a stack of cards in the following denominations: 100 calories, 200 calories, 300 calories, 500 calories

Each group has a game board and a single die.

The first player rolls the die.

1 = 100 calories

2 = 200 calories

3 = 300 calories

4 = unusable calories (see below)

5 = 500 calories

6 = 0 calories

The purpose of the game is to collect calorie cards and to cash them in for exercise. 1 unit of exercise is equal to a piece of the metabolic pathway. The goal of the game is to construct the longest metabolic pathway in your group. The first person to construct a metabolic pathway consisting of 10 exercise units OR the person with the longest pathway when the game is finished, WINS!

***If you roll a 4, all of your calories turn into stored energy, not usable energy.*** These calories can no longer be used to purchase exercise units. You must return your calorie cards to their respective piles.

Purchasing exercise units:

300 calories = 1 exercise unit

500 calories = 2 exercise units

700 calories = 3 exercise unit.

The more calories that you have, the more exercise you can do. You can only cash in your calories for exercise ***BEFORE*** you roll on your next turn.

**The strategy:** Do you collect as many calories as possible so that you can build your metabolic pathway faster (but risk rolling a 4 and not being able to use your energy?)? OR do you build your pathway in smaller pieces as you go, using up your energy as you consume it?

**\*\*\*You MUST answer a review question in order to purchase exercise units\*\*\***

|  |  |  |  |
| --- | --- | --- | --- |
| **100 calories**  [http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1) | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |
| **100 calories**  **[http://t3.gstatic.com/images?q=tbn:ANd9GcRw9v6_OIR7TX1MtRxvyFTFZGKFQEMwflM_Qz8GahU5z9UcQYvpMA](http://www.google.ca/imgres?q=banana&hl=en&biw=1280&bih=603&gbv=2&tbm=isch&tbnid=TcAjLoNejipimM:&imgrefurl=http://topbanana.wordpress.com/2011/12/03/flesh-eating-bananas/&docid=G_G7k_WSeIAscM&imgurl=http://topbanana.files.wordpress.com/2011/12/big-banana.jpg&w=2000&h=1500&ei=3e9gT7GTO8iOsALcoMyWCA&zoom=1)** | **200 calories** | **300 calories** | **500 calories** |

**The Metabolic Pathway**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **START 1** | **START 2** | **START 3** | **START 4** | **START 5** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **FINISH** | **FINISH** | **FINISH** | **FINISH** | **FINISH** |

1. Enzymes are made of
2. Carbohydrates
3. Proteins
4. Nucleic acids
5. Lipids
6. What is the optimal pH for most enzymes?
7. 10 b) 7
8. 3 d) 12
9. Describe a redox reaction with respect to the gain or loss of electrons.
10. What factor(s) can affect enzyme activity?
11. Temperature
12. pH
13. the presence of inhibitors
14. substrate concentration
15. all of the above
16. Describe the main function of the mitochondria.
17. Hydrogen bonds are attractions between
18. Hydrogen atoms on different molecules
19. Hydrogen molecules
20. Hydrogen atoms and oxygen or nitrogen atoms in the same molecule
21. Hydrogen atoms on one molecule and oxygen (or nitrogen) atoms on another molecule
22. What types of bonds hold cellular membranes together?
23. The melting of ice is an example of
24. Increasing enthalpy
25. Decreasing enthalpy
26. Increasing entropy
27. Decreasing entropy



